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Anthony R. Brown
Project Manager, Mining

September 6, 2017

Dana Barton and Gary Riley
Remedial Project Manager, Superfund Division
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street (SFD 7-2)
San Francisco, California 94105

Subject: **Supplemental Sludge Stabilization Testing,**
Interim Combined Acid Drainage Treatability Investigation
Leviathan Mine Site
Alpine County, California

Dear Ms. Barton and Mr. Riley:

Atlantic Richfield Company (Atlantic Richfield) has prepared this letter to inform the U.S. Environmental Protection Agency (U.S. EPA) of supplemental bench-scale sludge stabilization tests that will be completed during the 2017 field season at the Leviathan Mine Site (site) in Alpine County, California. The proposed supplemental testing will be conducted in conjunction with the Full-Scale Interim Combined Acid Drainage Treatability Demonstration, which is being conducted to evaluate use of the High Density Sludge (HDS) Treatment Plant and existing pond storage for interim combined treatment (ICT) of acid drainage (AD) from the managed AD discharges at the site. The 2017 ICT Demonstration is being executed in accordance with an amended Work Plan (Amendment No. 2, submitted March 31, 2017), with which U.S. EPA concurred in April, 2017.

BACKGROUND AND OBJECTIVES

Treatment of AD at the site produces waste sludge as a byproduct. Sludge from the HDS Treatment Plant is periodically pumped from the bottom of the clarifier to dewatering bins. The dewatered sludge is sampled to characterize the waste, and analytical results are compared to regulatory thresholds prior to shipment off-site for disposal. Sludge from the HDS Treatment Plant, which has been produced by treatment of AD from the Channel Underdrain (CUD) and Delta Seep (DS), is typically classified as a non-RCRA California hazardous waste, due to elevated levels of nickel in Soluble Threshold Limit Concentration (STLC) extracts. Samples of the HDS Treatment Plant sludge collected in July 2015, June 2016, and May 2017 had STLC nickel concentrations of 49, 33, and 36 milligrams per liter (mg/L), respectively, each exceeding the STLC regulatory limit of 20 mg/L for nickel. All other constituents were below their respective STLC threshold values.

For the 2017 ICT Demonstration, the HDS Treatment Plant has been used to treat combined AD from the CUD, DS, the Pit Underdrain (PUD), and the Adit. A sample of the sludge produced during the ICT Demonstration was collected on July 10, 2017. The sample had an STLC nickel concentration of 24 mg/L, exceeding the STLC regulatory limit of 20 mg/L for nickel, while all other constituents were below their respective regulatory threshold values.

The bench-scale tests proposed in this letter will evaluate the stabilization of waste sludge that was generated by the HDS Treatment Plant during 2017 treatment of combined AD flows (CUD, DS, the PUD, and the Adit). The objective of the proposed bench-scale tests is to determine if the addition of binding agents, buffering agents, and subsequent curing can stabilize the sludge and reduce the STLC extractable concentrations of metals. Wasted HDS Treatment Plant sludge will be amended with Portland Cement (PC), fly ash (FA), and lime, each of which are readily available, inexpensive, and commonly used as agents for stabilization of hazardous wastes. The stabilized sludge will be characterized to determine if the resulting leachate composition complies with state and federal regulatory threshold values for non-hazardous waste.

The bench-scale sludge stabilization tests will generate cost and performance data that will support the upcoming Feasibility Study (FS) for the site. The results of the sludge stabilization tests and the ICT Demonstration will be used in the FS to assess and select a final, long-term remedy for the site, including management of sludge produced during treatment of AD. Evaluation of the chemistry and stability of sludge was identified as a treatability inve stigation objective in Amendment No. 2.

This letter outlines the procedures that will be used to perform the bench-scale sludge stabilization tests during 2017 Full-Scale ICT Demonstration.

BENCH-SCALE TEST OVERVIEW

Waste sludge generated during the recent ICT Demonstration (combined treatment of AD from the CUD, DS, PUD, and Adit) will be stabilized using three sludge additives in the proportions shown in Table 1. Type I (general purpose) PC will be obtained from a local hardware store, and FA, which is a fine ash residue produced at coal-fired power plants, will be obtained from a construction materials supplier. Powdered hydrated lime (calcium hydroxide, or $Ca(OH)_2$) that is used for neutralizing the HDS Treatment System influent will be used for the sludg e stabilization tests. All three of these materials have been used to stabilize various types of hazardous wastes, including water treatment sludges. Because PC and FA are not typically used at the site, Safety Data Sheets (SDS) for these materials are included as Attachments 1 and 2, respectively.

These binders will be mixed in different proportions with waste HDS Treatment Plant sludge collected from a dewatering bin, then cured for 28 days at ambient conditions. After stabilization, samples of treated and untreated sludge will be prepared and submitted to Test America for laboratory analyses as specified in Table 2. The effectiveness of these materials for stabilizing HDS Treatment Plant sludge will be evaluated by comparing analytical results to regulatory thresholds and by comparing results from treated and untreated sludge samples.

EQUIPMENT AND MATERIALS

The following equipment and materials will be used to perform the bench-scale tests and are currently available on-site or will be brought to the site:

- Sludge collection container: 5-gallon plastic bucket for collecting sludge slurry from dewatering bin;
- Stainless steel mixing bowls;
- PC from local hardware store (Safety Data Sheet [SDS] included as Attachment 1);
- Class C or Class F FA (SDS for Class F FA from Salt River Materials included as Attachment 2)[1];
- Powdered lime from the HDS Treatment System;
- Sample weighing boats and digital scale to weigh the PC and FA;
- Metal utensils for adding lime, PC, and FA to sample weighing boats;
- pH analyzer;
- Electric drill and paint mixer attachment for mixing sludge and binders (or stainless steel tools for mixing by hand);
- All required personal protective equipment (PPE) including nitrile gloves and site-specific level D PPE;
- Detergent, dilute hydrochloric acid rinse, deionized water, lab wipers or paper towels, and waste disposal buckets for cleaning the sampling and mixing equipment; and
- Eighty (80) 8-ounce (oz) wide mouth sample jars (glass or plastic) with Teflon lined caps to be provided by Test America laboratory.

PROCEDURES FOR PREPARING STABILIZED SLUDGE SAMPLES

Stabilized waste sludge samples will be prepared by following the procedures described below:

1. Obtain a representative sample of waste sludge from a dewatering bin that has sludge produced during the ICT Demonstration and that has been allowed to dewater.
2. Using a clean, calibrated pH probe, measure and record the pH of the untreated sludge.
3. For the untreated sludge sample: fill sample jars with sludge according to Table 2.

[1] Class C FA is preferred because it has more free lime than Class F FA. Class C FA would thus increase pH to a greater degree and more effectively precipitate metals. However, Class F FA may be used in combination with powdered lime as an alternate binding agent to Class C FA cannot be obtained in a timely manner.

4. Send untreated sludge sample (Treatment 1) to Test America under chain of custody for analysis according to the methods described in the following section.
5. Prepare the stabilized sludges:
    a. Measure 500 grams (g) of wet sludge into a clean stainless steel mixing bowl. (The mass may be increased or reduced, as necessary, to obtain sufficient sample quantity.)
    b. Add lime, PC, or FA into the mixing bowl according to the quantities in Table 2. Note that for treatments with lime, the mass to add is not yet known; lime will be added to raise the pH of the treated sludge to different targets.
    c. Using the electric drill with paint mixer attachment (or hand mixing tools), homogenize the amended sludge for at least 1 minute.
    d. Measure and record the pH of the amended sludge after mixing using a clean, calibrated pH probe. For lime-amended sludges, record both the mass of lime added and the pH of the amended sludge. The pH of amended sludge will be measured on-site immediately after mixing. Amended sludge will be mixed with water (1:1 volumetric ratio) to measure pH.
    e. For each treatment, fill sample jars with amended sludge as shown in Table 2.
    f. Decontaminate the pH probe, mixing bowl, and mixing tools.
    g. Repeat this procedure for different sludge treatments according to Table 2.
    h. Cure the amended sludge for 28 days at ambient conditions.
6. After curing, sample the stabilized sludge and send samples to Test America under chain of custody for analysis according to the methods described in Table 2 and the following section.

LABORATORY ANALYSES

Stabilized and untreated (control) sludge samples will be prepared and submitted to Test America Laboratories under chain of custody procedures and in accordance with written SOPs for the Leviathan Mine Site. All samples that are submitted to Test America will be analyzed for the following parameters using the methods specified in Table 2, which are consistent with the analytical methods that are being used for the ICT Demonstration.

1. STLC metals
2. Toxicity Characteristic Leaching Procedure (TCLP) metals
3. Total Threshold Limit Concentration (TTLC) metals
4. Synthetic Precipitation Leaching Procedure (SPLP) metals
5. Deionized water waste extraction test (DI-WET)

6. Dry specific gravity
7. Paste pH
8. Moisture content

INVESTIGATION DERIVED WASTE

Investigation-derived waste that may be generated during this sludge stabilization test will be collected and disposed according to approved waste handling and disposal methods.

HEALTH AND SAFETY PROCEDURES

All tasks described in this letter work plan will be performed in accordance with the Task Specific Health and Safety Plans (TSHASPs) prepared by Atlantic Richfield's contractors based on the Health, Safety, Security, and Environment (HSSE) Program Document. The HSSE Program Document is the site-wide occupational health and safety guidance document for the Atlantic Richfield project team, which includes Atlantic Richfield personnel, primary contractors, subcontractors and visitors that are working at or visiting the site. Each person who performs work at the site as an Atlantic Richfield employee, contractor, subcontractor, or visitor is expected to read and acknowledge understanding of the current HSSE Program Document and applicable TSHASPs, Atlantic Richfield Remediation Management's (RM's) Control of Work (CoW) Defined Practices and HSSE expectations, and participate in a process of continuous health and safety improvement. Additionally, the appropriate Risk Assessments, SOPs, and permits will be completed prior to initiating any of the work described herein in accordance with site HSSE requirements.

REPORTING

Results of these sludge stability tests will be prepared and submitted to the U.S. EPA in the Winter/Spring of 2018.

SCHEDULE

Atlantic Richfield intends to conduct the sludge stabilization bench scale study in September 2017 utilizing ICT Demonstration sludge.

If you have any questions or comments, please feel free to contact me at (657) 529-4537 or anthony.brown@bp.com.

Sincerely,

Anthony R. Brown
Project Manager, Mining

Tables:

Table 1	Sludge Stabilization Treatment Matrix
Table 2	Sludge Stabilization Test Standard Sampling Matrix

Attachments:

Attachment 1	Safety Data Sheet for Basalite Portland Cement
Attachment 2	Safety Data Sheet for Salt River Materials Group Fly Ash

cc: Brian Johnson, Atlantic Richfield – via electronic copy
John Hillenbrand, U.S. Environmental Protection Agency, Region 9 – via electronic copy
Douglas Carey, Lahontan Regional Water Quality Control Board – via electronic copy
Scott Ferguson, Lahontan Regional Water Quality Control Board – via electronic copy
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Adam Cohen, Esq., Davis Graham & Stubbs, LLP – via electronic copy
Sandy Riese, EnSci, Inc. – via electronic copy
Marc Lombardi, Amec Foster Wheeler – via electronic copy
Craig Weber, Amec Foster Wheeler Environment & Infrastructure, Inc. – via electronic copy
Grant Ohland, Ohland HydroGeo, LLC – via electronic copy
Dave McCarthy, Copper Environmental Consulting – via electronic copy
Jeremy Boucher, Broadbent & Associates, Inc. – via electronic copy
Cory Koger, U.S. Army Corps of Engineers – via electronic copy
Greg Reller, Burleson Consulting – via electronic copy
Norman Harry, Washoe Tribe of California and Nevada – via electronic copy
Susan Jamerson, Washoe Tribe of California and Nevada – via electronic copy
Neil Mortimer, Washoe Tribe of California and Nevada – via electronic copy
Cale Pete, Washoe Tribe of California and Nevada – via electronic copy
Fred Kirschner, AESE, Inc. – via electronic copy

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TABLES

TABLE 1
SLUDGE STABILIZATION TREATMENT MATRIX
Leviathan Mine Site
Alpine County, California

Treatment	Composition Weight%		Composition of Binder			Masses to Combine[b]			
	Sludge %	Binder %	PC%	FA%	Lime%	Wet Sludge (g)	PC (g)	FA (g)	Lime (g)
1[a]	100%	0%	0%	0%	0%	500	0	0	0
2A	95%	5.0%	0%	100%	0%	500	0	26	0
2B	95%	5.0%	50%	50%	0%	500	13	13	0
2C	95%	5.0%	100%	0%	0%	500	26	0	0
3A	90%	10%	0%	100%	0%	500	0	56	0
3B	90%	10%	50%	50%	0%	500	28	28	0
3C	90%	10%	100%	0%	0%	500	56	0	0
4A	85%	15.0%	0%	100%	0%	500	0	88	0
4B	85%	15.0%	50%	50%	0%	500	44	44	0
4C	85%	15.0%	100%	0%	0%	500	88	0	0
5A	80%	20%	0%	100%	0%	500	0	125	0
5B	80%	20%	50%	50%	0%	500	63	63	0
5C	80%	20%	0%	100%	0%	500	0	125	0
6A[c]	90%	TBD[c]	0%	TBD[c]	TBD[c]	500	0	15	TBD[c] to pH 11
6B[c]	90%	TBD[c]	0%	TBD[c]	TBD[c]	500	0	30	TBD[c] to pH 11
6C[c]	90%	TBD[c]	0%	TBD[c]	TBD[c]	500	0	45	TBD[c] to pH 11
7A[d]	TBD - to pH 9		0%	0%	100%	500	0	0	TBD
7B[d]	TBD - to pH 10		0%	0%	100%	500	0	0	TBD
7C[d]	TBD - to pH 11		0%	0%	100%	500	0	0	TBD
7D[d]	TBD - to pH 12		0%	0%	100%	500	0	0	TBD
					Totals (g)	10000	318	658	0

Note(s):

All treated and untreated sludge samples will be prepared using dewatered sludge collected from a dewatering bin.

All % values are by weight. Sludge weight is wet weight.

Stabilization treatment includes addition of binders and curing for 28 days. Stabilized sludge samples will be collected and sent to the laboratory after completing this treatment.

a. Untreated control, with no stabilizing agents. This sample will be collected when the dewatered sludge is collected.

b. Masses may be adjusted, as necessary, to obtain sufficient sample quantity.

c. Treatment 6 combines lime and fly ash. FA will be added in amounts shown, then lime will be added in varying amounts to reach a final pH of 11.

d. Treatment 7 is with Lime only. For each treatment, varying amounts of lime will be added to the sludge to reach a target pH.

Abbreviation(s):

% = percent
FA = Fly ash
PC = Portland cement
g = grams
TBD = to be determined

TABLE 2
SLUDGE STABILIZATION TEST STANDARD SAMPLING MATRIX
Leviathan Mine Site
Alpine County, California

Parameters		STLC	TCLP	TTLC	SPLP	DI-WET	Dry Specific Gravity	Paste pH	Moisture Content
Laboratory		Test America							
Method		CA WET Citrate/ EPA 6010B/ 7470A	EPA 1311/ 3010A/ 6010B/ 7470A	EPA 6010B/ 7471A	EPA 1312/ 3010A/ 6010B/ 7470A	CA DI-WET EPA 6010B/ 7470A	ASTM D854 Dry Specific Gravity	DI Leach/ SW 846 9045C	EPA Moisture
Containers		3 x 8 oz WMC							1 x 8 oz WMC
Minimum Quantity		100 g	200 g	5 g	200 g	100 g	125 g	25 g	10 g
Field Filtered		No							No
Preservation[1]		None							None
Maximum Holding		28 d	28 d	28 d	28 d	28 d	NA	7 d	28 d
Study Area	Location ID								
LCSA	HDSICT-SLDG	X	X	X	X	X	X	X	X
	Total Samples	20							

Note(s):

1. Samples should be stored at a temperature ranging from 0°C - 6°C.
Stabilized sludge will be prepared as in Table 2. Stabilization treatment includes addition of binders and curing for 28 days at ambient conditions, after which samples will be collected and sent to the laboratory for analysis.

Sample ID(s):

WSLMMDDYYXX Use for all waste samples collected in the LCSA, consecutively, for a given date.

Sample Matrix:

WS Use for all primary and duplicate waste samples.

W Use for all field blanks.

Abbreviation(s):

°C = degrees Celsius
d = days
DI-WET = Deionized water waste extraction test
EPA = Environmental Protection Agency
g = grams
ID = identification
LCSA = Leviathan Creek Study Area
NA = not applicable
oz = ounce
SPLP = Synthetic Precipitation Leaching Procedure
STLC = Soluble Threshold Limit Concentration
TCLP = Toxicity Characteristic Leaching Procedure
TDS = total dissolved solids
TTLC = Total Threshold Limit Concentration
WMC = wide mouth container (glass or poly)

ATTACHMENT 1

Safety Data Sheet for Basalite Portland Cement

BASALITE Concrete Products, LLC

SAFETY DATA SHEET

Section 1: IDENTIFICATION

1.1 PRODUCT IDENTIFIER

Product Name: Basalite Cement Mixes 47# and 94# (Portland Cements, Type II, Type V, Block, Plastic, White)

1.2 RECOMMENDED USE OF CHEMICAL AND RESTRICTIONS ON USE

Use: Various.

1.3 DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

Name/Address: Basalite Concrete Products
605 Industrial Way
Dixon, CA 95620

Telephone Number: 707-678-1901

1.4 EMERGENCY TELEPHONE NUMBER

Emergency Telephone Number: CHEMTREC 800 424-9300
INTERNATIONAL +01-703-527-3887

Date of Preparation: February 1, 2013 **Version #:** 1.1

Section 2: HAZARD(S) IDENTIFICATION

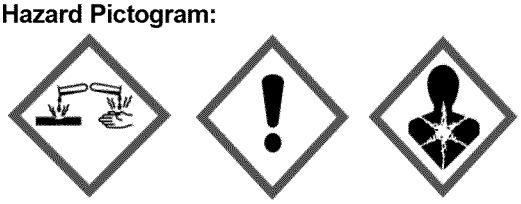
2.1 CLASSIFICATION OF THE CHEMICAL

Hazard class

Acute toxicity 4 (Oral)
Skin irritation 2
Serious eye damage 1
Skin sensitization 1
Carcinogenicity 1A
Specific target organ toxicity - Single exposure 3
Specific target organ toxicity - Repeated exposure 1

2.2 LABEL ELEMENTS

Hazard Pictogram:



Signal Word: Danger

Hazard Statement: Harmful if swallowed. Causes skin irritation. Causes serious eye damage. May cause an allergic skin reaction. May cause cancer. May cause respiratory irritation. Causes damage to organs through prolonged or repeated exposure.

Prevention: Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace. Obtain special instructions before use. Do not handle until all safety precautions have been read and

SAFETY DATA SHEET

understood. Wear protective gloves/protective clothing/eye protection/face protection. Use only outdoors or in a well-ventilated area. Do not breathe dust.

Response: If swallowed: Immediately call a poison center/doctor. Rinse mouth. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. If on skin: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If skin irritation or rash occurs: Get medical advice/attention. If exposed or concerned: Get medical advice/attention. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.

Storage: Store locked up. Store in a well-ventilated place. Keep container tightly closed.

Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.

2.3 ADDITIONAL INFORMATION

Hazards not otherwise classified: Not applicable.

60.0 % of the mixture consists of ingredient(s) of unknown acute toxicity.

This product is a hazardous chemical as defined by NOM-018-STPS-2000.

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 MIXTURES

Ingredient	UN #	H / F / R / *	CAS No	Wt. %
Portland cement	Not available.	1/0/0	65997-15-1	60 - 100
Ferric oxide	UN1376	1/0/0	1309-37-1	10 - 30
Silica, crystalline, quartz	Not available.	Not available.	14808-60-7	3 - 7
Calcium oxide	UN1910	3/0/1	1305-78-8	3 - 7
Gypsum	UN3077	Not available.	13397-24-5	3 - 7
Calcium carbonate	Not available.	1/0/0	1317-65-3	3 - 7
Magnesium oxide	UN1418	2/0/0	1309-48-4	3 - 7

The exact percentage (concentration) of chemicals has been withheld as a trade secret in accordance with paragraph (i) of §1910.1200.

*Per NOM-018-STPS-2000

Section 4: FIRST-AID MEASURES

4.1 DESCRIPTION OF THE FIRST AID MEASURE

Eye: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lenses, if worn. Get medical attention immediately.

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Skin: In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician if irritation develops and persists.

Inhalation: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention if you feel unwell.

Ingestion: If swallowed, do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical advice/attention.

4.2 MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

Eye: Causes serious eye damage. May cause burns in the presence of moisture. Symptoms may include discomfort or pain, excess blinking and tear production, with possible redness and swelling.

Skin: Causes skin irritation. May cause burns in the presence of moisture. Skin contact during hydration may slowly develop sufficient heat that may cause severe burns possibly resulting in permanent injury. Do not allow product to harden around any body part or allow continuous, prolonged contact with skin. Handling can cause dry skin. May cause sensitization by skin contact.

Inhalation: May cause respiratory tract irritation.

Ingestion: Harmful if swallowed. May cause stomach distress, nausea or vomiting.

4.3 INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENTS NEEDED

Note to Physicians: Symptoms may not appear immediately.

Specific Treatments: In case of accident or if you feel unwell, seek medical advice immediately (show the label or SDS where possible).

Section 5: FIRE-FIGHTING MEASURES

5.1 EXTINGUISHING MEDIA

Suitable Extinguishing Media: Treat for surrounding material.

Unsuitable Extinguishing Media: Not available.

5.2 SPECIAL HAZARDS ARISING FROM THE CHEMICAL

Products of Combustion: May include, and are not limited to: oxides of carbon.

5.3 SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIRE FIGHTERS

Keep upwind of fire. Wear full fire fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA).

Section 6: ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

Use personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel.

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6.2 METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING-UP

Methods for Containment: Contain spill, then place in a suitable container. Do not flush to sewer or allow to enter waterways. Use appropriate Personal Protective Equipment (PPE).

Methods for Cleaning-Up: Vacuum or sweep material and place in a disposal container.

Section 7: HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING

Handling: Avoid contact with skin and eyes. Do not swallow. Good housekeeping is important to prevent accumulation of dust. Avoid generating and breathing dust. The use of compressed air for cleaning clothing, equipment, etc, is not recommended. Handle and open container with care. When using do not eat or drink. Wash hands before eating, drinking, or smoking. (See section 8)

General Hygiene Advice: Launder contaminated clothing before reuse. Wash hands before eating, drinking, or smoking.

7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

Storage: Keep out of the reach of children. Store in dust-tight, dry, labeled containers. Keep containers closed when not in use. Avoid any dust buildup by frequent cleaning and suitable construction of the storage area. Do not store in an area equipped with emergency water sprinklers. (See section 10)

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 CONTROL PARAMETERS

Exposure Guidelines

Occupational Exposure Limits		
Ingredient	**OSHA-PEL**	**ACGIH-TLV**
Portland cement	15 mg/m³ (total); 5 mg/m³ (resp)	1 mg/m³ (no asbestos and <1% crystalline silica, respirable fraction)
Ferric oxide	10 mg/m^3	5 mg/m^3 (iron oxide fume; dust as Fe)
Silica, crystalline, quartz	((10 mg/m^3)/(%SiO_2+2) TWA (resp)) ((30 mg/m^3)/(%SiO_2+2) TWA (total)) ((250)/(%SiO_2+5) mppcf TWA (resp))	0.025 mg/m³
Calcium oxide	5 mg/m³	2 mg/m^3
Gypsum	15 mg/m^3 TWA (poussière totale) 5 mg/m^3 TWA (fraction respirable)	10 mg/m^3
Calcium carbonate	15 mg/m³ (total); 5 mg/m³ (resp)	10 mg/m³
Magnesium oxide	15 mg/m^3	10 mg/m^3

8.2 EXPOSURE CONTROLS

Engineering Controls: Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, etc.) below recommended exposure limits.

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8.3 INDIVIDUAL PROTECTIVE MEASSURES

Personal Protective Equipment:

Eye/Face Protection: Wear approved eye (properly fitted dust- or splash-proof chemical safety goggles)/ face (face shield) protection.

Skin Protection:

Hand Protection: Wear suitable waterproof gloves.

Body Protection: Wear suitable waterproof protective clothing.

Respiratory Protection: A NIOSH approved dust mask or filtering facepiece is recommended in poorly ventilated areas or when permissible exposure limits may be exceeded. Respirators should be selected by and used under the direction of a trained health and safety professional following requirements found in OSHA's respirator standard (29 CFR 1910.134) and ANSI's standard for respiratory protection (Z88.2).

General Health and Safety Measures: Handle according to established industrial hygiene and safety practices. Do not eat, smoke or drink where material is handled, processed or stored. Wash hands carefully before eating or smoking.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Powder.
Color:	Not available.
Odor:	Not available.
Odor Threshold:	Not available.
Physical State:	Powder.
pH:	12 - 13
Melting Point/Freezing Point:	Not available.
Initial Boiling Point and Boiling Range:	Not available.
Flash Point:	Not available.
Evaporation Rate:	Not available.
Flammability:	Not Flammable.
Lower Flammability/Explosive Limit:	Not available.
Upper Flammability/Explosive Limit:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Relative Density/Specific Gravity:	Not available.
Solubility:	Not available.
Partition coefficient: n-octanol/water:	Not available.
Auto-ignition Temperature:	Not available.
Decomposition Temperature:	Not available.

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Viscosity:	Not available.
Percent Volatile, wt%:	Not available.
VOC content, wt.%:	0%, Not applicable; 0 wt, Not applicable.

Section 10: STABILITY AND REACTIVITY

10.1 REACTIVITY

No dangerous reaction known under conditions of normal use.

10.2 CHEMICAL STABILITY

Stable under normal storage conditions. Keep dry in storage.

10.3 POSSIBILITY OF HAZARDOUS REACTIONS

No dangerous reaction known under conditions of normal use.

10.4 CONDITIONS TO AVOID

Incompatible materials. Moisture.

10.5 INCOMPATIBLE MATERIALS

None known.

10.6 HAZARDOUS DECOMPOSITION PRODUCTS

May include, and are not limited to: oxides of carbon.

Section 11: TOXICOLOGICAL INFORMATION

11.1 INFORMATION ON TOXICOLOGICAL EFFECTS

Likely Routes of Exposure: Skin contact, skin absorption, eye contact, inhalation, and ingestion.

Symptoms related to physical/chemical/toxicological characteristics:

Eye: Causes serious eye damage. May cause burns in the presence of moisture. Symptoms may include discomfort or pain, excess blinking and tear production, with possible redness and swelling.

Skin: Causes skin irritation. May cause burns in the presence of moisture. Skin contact during hydration may slowly develop sufficient heat that may cause severe burns possibly resulting in permanent injury. Do not allow product to harden around any body part or allow continuous, prolonged contact with skin. Handling can cause dry skin. May cause sensitization by skin contact.

Ingestion: Harmful if swallowed. May cause stomach distress, nausea or vomiting.

Inhalation: May cause respiratory tract irritation.

Acute Toxicity:

Ingredient	IDLH	LC50	LD50
Portland cement	5000 mg/m^3	Not available.	Not available.
Ferric oxide	2500 mg Fe/m^3	Not available.	Oral >10000 mg/kg, rat
Silica, crystalline, quartz	Ca [25 mg/m^3 (cristobalite, tridymite) 50 mg/m^3 (quartz, tripoli)]	Not available.	Oral 500 mg/kg, rat
Calcium oxide	25 mg/m^3	Not available.	Oral 500 mg/kg, rat
Gypsum	Not available.	Not available.	Not available.

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Calcium carbonate	Not available.	Not available.	Not available.
Magnesium oxide	750 mg/m^3	Not available.	Oral >5000 mg/kg, rat

Calculated overall Chemical Acute Toxicity Values		
LC50 (inhalation)	**LD50 (oral)**	**LD50 (dermal)**
Not available.	1603.8 mg/kg, rat	Not available.

Ingredient	**Chemical Listed as Carcinogen or Potential Carcinogen (NTP, IARC, OSHA, ACGIH, CP65)***
Portland cement	G-A4
Ferric oxide	G-A4, I-3
Silica, crystalline, quartz	G-A2, I-1, N-1, CP65
Calcium oxide	Not listed.
Gypsum	Not listed.
Calcium carbonate	Not listed.
Magnesium oxide	G-A4

11.2 DELAYED, IMMEDIATE, AND CHRONIC EFFECTS OF SHORT- AND LONG-TERM EXPOSURE

Skin Corrosion/Irritation: Causes skin irritation. May cause burns in the presence of moisture.

Serious Eye Damage/Irritation: Causes serious eye damage. May cause burns in the presence of moisture.

Respiratory Sensitization: Based on available data, the classification criteria are not met.

Skin Sensitization: May cause an allergic skin reaction.

STOT-Single Exposure: May cause respiratory irritation.

Chronic Health Effects: Respirable crystalline silica in the form of quartz or cristobalite from occupational sources is listed by the International Agency for Research on Cancer (IARC) and National Toxicology Program (NTP) as a lung carcinogen. Prolonged exposure to respirable crystalline silica has been known to cause silicosis, a lung disease, which may be disabling. While there may be a factor of individual susceptibility to a given exposure to respirable silica dust, the risk of contracting silicosis and the severity of the disease is clearly related to the amount of dust exposure and the length of time (usually years) of exposure.

Carcinogenicity: May cause cancer.

Germ Cell Mutagenicity: This product is not classified as a mutagen.

Reproductive Toxicity:

Developmental: Based on available data, the classification criteria are not met.

Fertility: Based on available data, the classification criteria are not met.

STOT-Repeated Exposure: Causes damage to organs through prolonged or repeated exposure.

Aspiration Hazard: Based on available data, the classification criteria are not met.

Toxicologically Synergistic Materials: Not available.

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Other Information: Not available.

Section12: ECOLOGICALINFORMATION

12.1 ECOTOXICITY - ENVIRONMENTAL EFFECT ON AQUATIC HABITAT:

Uncured cementitious materialsor finely divided (crushed) concrete materialis an environmental hazard, which may adversely affect fish and other wildlifeDo not use crushed concreteas fill near any aquatic habitat. Disposeof construction debris containing cement, including empty bagsat a permitted landfill or by a disposal firm. Dischargeof large quantitiesto any waterways wouldbe expected to cause significant consequenceon aquatic habitat. Do not use crushed concreteas fill near any aquatic habitat.

12.2 PERSISTENCE AND DEGRADABILITY

Not available.

12.3 BIOACCUMULATIVE POTENTIAL

Bioaccumulation: Not available.

12.4 MOBILITYIN SOIL

Not available.

12.5 OTHERADVERSEEFFECTS Not available.

Section13:DISPOSALCONSIDERATIONS

13.1 WASTETREATMENTMETHODS

Disposal Method: This material mustbe disposedof in accordance with all local, state, provincialand federal regulations.

Otherdisposalrecommendations: Not available.

Section14: TRANSPORTINFORMATION

14.1 UN NUMBER

DOT	TDG	NOM-004-SCT2-1994
Not regulated.	Not regulated.	Not regulated.

14.2 UN PROPER SHIPPINGNAME

DOT	TDG	NOM-004-SCT2-1994
Not applicable.	Not applicable.	Not applicable.

14.3 TRANSPORTHAZARDCLASS(ES)

DOT	TDG	NOM-004-SCT2-1994
Not applicable.	Not applicable.	Not applicable.

14.4 PACKING GROUP

DOT	TDG	NOM-004-SCT2-1994
Not applicable.	Not applicable.	Not applicable.

14.5 ENVIRONMENTAL HAZARDS

Not available.

14.6 TRANSPORTIN BULK ACCORDINGTO ANNEXII OF MARPOL73/78 AND THE IBC CODE

Not available.

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14.7 SPECIAL PRECAUTIONS FOR USER

Do not handle until all safety precautions have been read and understood.

Section 15: REGULATORY INFORMATION

15.1 SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/ LEGISLATIONS SPECIFIC FOR THE CHEMICAL

US: MSDS prepared pursuant to the Hazard Communication Standard (CFR29 1910.1200) HazCom 2012

Mexico: MSDS prepared pursuant o NOM-018-STPS-2000.

SARA Title III				
Ingredient	**Section 302 (EHS) TPQ (lbs.)**	**Section 304 EHS RQ (lbs.)**	**CERCLA RQ (lbs.)**	**Section 313**
Portland cement	Not listed.	Not listed.	Not listed.	Not listed.
Ferric oxide	Not listed.	Not listed.	Not listed.	Not listed.
Silica, crystalline, quartz	Not listed.	Not listed.	Not listed.	Not listed.
Calcium oxide	Not listed.	Not listed.	Not listed.	Not listed.
Gypsum	Not listed.	Not listed.	Not listed.	Not listed.
Calcium carbonate	Not listed.	Not listed.	Not listed.	Not listed.
Magnesium oxide	Not listed.	Not listed.	Not listed.	Not listed.

State Regulations

California Proposition 65 Warning:

This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Global Inventories

Ingredient	USA TSCA
Portland cement	Yes.
Ferric oxide	Yes.
Silica, crystalline, quartz	Yes.
Calcium oxide	Yes.
Gypsum	No.
Calcium carbonate	Yes.
Magnesium oxide	Yes.

NFPA - National Fire Protection Association:	
Health:	3
Fire:	1
Reactivity:	0

HMIS - Hazardous Materials Identification System	
Health:	3*
Fire:	1
Reactivity:	0

Hazard Rating: 0 = minimal, 1 = slight, 2 = moderate, 3 = severe, 4 = extreme

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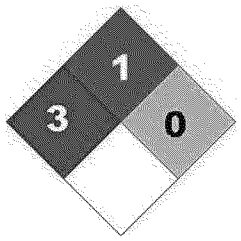
Mexico Classification:



Blue = Health Red = Flammability Yellow = Reactivity White = Special

Hazard Rating: 0 = minimal, 1 = slight, 2 = moderate, 3 = severe, 4 = extreme

SOURCE AGENCY CARCINOGEN CLASSIFICATIONS:

CP65 California Proposition 65

OSHA(O) Occupational Safety and Health Administration.

ACGIH(G) American Conference of Governmental Industrial Hygienists.
A1 - Confirmed human carcinogen.
A2 - Suspected human carcinogen.
A3 - Animal carcinogen.
A4 - Not classifiable as a human carcinogen.
A5 - Not suspected as a human carcinogen.

IARC (I) International Agency for Research on Cancer.
1 - The agent (mixture) is carcinogenic to humans.
2A - The agent (mixture) is probably carcinogenic to humans; there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals.
2B - The agent (mixture) is possibly carcinogenic to humans; there is limited evidence of carcinogenicity in humans in the absence of sufficient evidence of carcinogenicity in experimental animals.
3 - The agent (mixture, exposure circumstance) is not classifiable as to its carcinogenicity to humans.
4 - The agent (mixture, exposure circumstance) is probably not carcinogenic to humans.

NTP (N) National Toxicology Program.
1 - Known to be carcinogens.
2 - Reasonably anticipated to be carcinogens.

Section 16: OTHER INFORMATION

Date of Preparation: February 1, 2013

Version: 1.1

Revision Date: April 23, 2015 - Basalite address updated

Disclaimer: We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind. The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for the user's own particular use.

Prepared by: Nexreg Compliance Inc.
Phone: (519) 488-5126
www.nexreg.com

End of Safety Data Sheet

ATTACHMENT 2

Safety Data Sheet for Salt River Materials Group Fly Ash

Class F Fly Ash

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision Date: 06/05/2014 Date of Issue: 01/01/2005 Supersedes: 02/03/2010 Version: 1.0

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Form: Mixture

Product Name: Class F Fly Ash

Formula: Complex mixture of inorganic minerals including metals and silica

1.2. Intended Use of the Product

Use of the Substance/Mixture: Construction

1.3. Name, Address, and Telephone of the Responsible Party

Company

Phoenix Cement Company

8800 E. Chaparral Rd. Suite 155

Scottsdale, AZ 85250-2606

Customer Service: Phone (480)-850-5757 Fax (480) 850-4333

www.srmaterials.com

1.4. Emergency Telephone Number

Emergency Number : 1-800-424-9300 (CHEMTREC) 24-hour

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Classification (GHS-US)

Skin Irrit. 2	H315
Eye Irrit. 2A	H319
Carc. 1A	H350

2.2. Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :

GHS07 GHS08

Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) :
H315 Causes skin irritation
H319 Causes serious eye irritation
H350 May cause cancer (Inhalation)

Precautionary Statements (GHS-US) :
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P264 Wash hands, forearms, and exposed areas thoroughly after handling.
P280 Wear eye protection, protective clothing, protective gloves.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 If exposed or concerned: Get medical advice/attention.
P321 Specific treatment (see Section 4).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P337+P313 If eye irritation persists: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P501 Dispose of contents/container according to local, regional, national, and international regulations.

2.3. Other Hazards

Other Hazards Not Contributing to the Classification: Smoking increases the risk of bronchitis, silicosis, and lung cancer that is associated with this product. This product may also increase the risk of scleroderma for which the causes are unknown, but some reports link overexposure to silica in combination with other chemicals to this disease.

2.4. Unknown Acute Toxicity (GHS-US)

No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	Classification (GHS-US)
Calcium oxide	(CAS No) 1305-78-8	1 - 3	Skin Corr. 1C, H314 Eye Dam. 1, H318 STOT SE 3, H335
Quartz	(CAS No) 14808-60-7	0 - 0.5	Carc. 1A, H350 STOT SE 3, H335 STOT RE 1, H372

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First Aid Measures

First-aid Measures General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice.

First-aid Measures After Inhalation: If inhaled, remove to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER/doctor/physician if you feel unwell.

First-aid Measures After Skin Contact: Remove contaminated clothing. Gently wash with plenty of soap and water followed by rinsing with water for at least 15 minutes. Call a POISON CENTER or doctor/physician if you feel unwell. Wash contaminated clothing before reuse.

First-aid Measures After Eye Contact: Do not rub. Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

First-aid Measures After Ingestion: Rinse mouth. Do not induce vomiting. Get medical advice and attention

4.2. Most Important Symptoms and Effects, both Acute and Delayed

Symptoms/Injuries: Irritation to eyes, skin and respiratory tract.

Symptoms/Injuries After Inhalation: May cause cancer by inhalation. May cause respiratory irritation.

Symptoms/Injuries After Skin Contact: May cause irritation.

Symptoms/Injuries After Eye Contact: May cause eye irritation.

Symptoms/Injuries After Ingestion: May be harmful if swallowed.

Chronic Symptoms: If dust is generated, repeated exposure through inhalation may cause cancer or lung disease

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Unsuitable Extinguishing Media: Do not use a heavy water stream.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not flammable.

Explosion Hazard: Product is not explosive.

Reactivity: Adding water produces (caustic) calcium hydroxide. Reacts exothermically with (some) acids

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Do not allow run-off from fire fighting to enter drains or water courses.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Do not get in eyes, on skin, or on clothing. Do not breathe dust.

6.1.1. For Non-emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

6.1.2. For Emergency Responders

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Ventilate area.

6.2. Environmental Precautions

Prevent entry to sewers and public waters.

6.3. Methods and Material for Containment and Cleaning Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for Cleaning Up: Clear up spills immediately and dispose of waste safely. Avoid generation of dust during clean-up.

6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: Product becomes alkaline when exposed to moisture or water. Exposure can cause chemical burns, or severe irritation of the mucous membranes, skin, eyes, and other exposed areas.

Precautions for Safe Handling: Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Storage Conditions: Store in a dry, cool, well-ventilated place. Protect from moisture. Keep container closed when not in use.

Incompatible Products: Strong acids. Halogens (F, Cl, Br, I). Metals.

7.3. Specific End Use(s)

Construction.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

Quartz (14808-60-7)		
USA ACGIH	ACGIH TWA (mg/m³)	0.025 mg/m³
USA NIOSH	NIOSH REL (TWA) (mg/m³)	0.05 mg/m³
USA IDLH	US IDLH (mg/m³)	50 mg/m³

Calcium oxide (1305-78-8)		
USA ACGIH	ACGIH TWA (mg/m³)	2 mg/m³
USA NIOSH	NIOSH REL (TWA) (mg/m³)	2 mg/m³
USA IDLH	US IDLH (mg/m³)	25 mg/m³
USA OSHA	OSHA PEL (TWA) (mg/m³)	5 mg/m³

Aluminum oxide (1344-28-1)		
USA OSHA	OSHA PEL (TWA) (mg/m³)	5 mg/m³

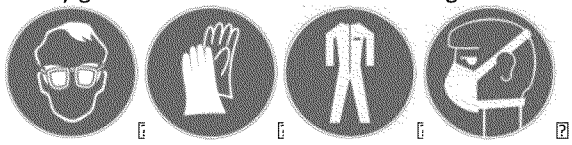
Silica, amorphous (7631-86-9)		
USA NIOSH	NIOSH REL (TWA) (mg/m³)	6 mg/m³
USA IDLH	US IDLH (mg/m³)	3000 mg/m³

Iron oxide (Fe2O3) (1309-37-1)		
USA ACGIH	ACGIH TWA (mg/m³)	5 mg/m³
USA NIOSH	NIOSH REL (TWA) (mg/m³)	5 mg/m³
USA IDLH	US IDLH (mg/m³)	2500 mg/m³
USA OSHA	OSHA PEL (TWA) (mg/m³)	5 mg/m³

8.2. Exposure Controls

Appropriate Engineering Controls: : Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment: : Safety glasses. Gloves. Protective clothing. Dust formation: dust mask.



Hand Protection: : Wear chemically resistant protective gloves.

Eye Protection: : Chemical goggles or safety glasses.

Skin and Body Protection: : Wear suitable protective clothing.

Respiratory Protection: : Use a NIOSH-approved respirator or self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits.

Other Information: : When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	: Solid
Appearance	: Light to dark gray, tan or charcoal colored powder of varying textures
Odor	: No distinctive odor.
Odor Threshold	: No data available
pH	: 9 - 11 (in water)
Relative Evaporation Rate (butylacetate=1)	: No data available
Melting Point	: > 760 °C (> 1,400 °F)
Freezing Point	: No data available
Boiling Point	: > 1093 °C (> 2,000 °F)
Flash Point	: No data available
Auto-ignition Temperature	: No data available
Decomposition Temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor Pressure	: No data available
Relative Vapor Density at 20 °C	: No data available
Relative Density	: 1.8 - 2.7
Solubility	: Water: 0.05 % (by weight)
Partition coefficient: n-octanol/water	: No data available
Viscosity	: No data available

9.2. Other Information No additional information available

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity: Adding water produces (caustic) calcium hydroxide. Reacts exothermically with (some) acids.

10.2 Chemical Stability: The product is stable at normal handling and storage conditions.

10.3 Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

10.4 Conditions to Avoid: Moisture. Avoid creating or spreading dust.

10.5 Incompatible Materials: Strong acids. Metals. Halogens.

10.6 Hazardous Decomposition Products: None.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information On Toxicological Effects

Acute Toxicity: Not classified

Quartz (14808-60-7)	
LD50 Oral Rat	> 5000 mg/kg

Calcium oxide (1305-78-8)	
ATE (Oral)	500.000 mg/kg

Skin Corrosion/Irritation: Causes skin irritation. (**pH:** 9 - 11 (in water))

Serious Eye Damage/Irritation: Causes serious eye irritation. (**pH:** 9 - 11 (in water))

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: May cause cancer (Inhalation).

Quartz (14808-60-7)	
IARC group	1
National Toxicity Program (NTP) Status	Known Human Carcinogens.

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: May cause cancer by inhalation. May cause respiratory irritation.

Symptoms/Injuries After Skin Contact: May cause irritation.

Symptoms/Injuries After Eye Contact: May cause eye irritation.

Symptoms/Injuries After Ingestion: May be harmful if swallowed.

Chronic Symptoms: If dust is generated, repeated exposure through inhalation may cause cancer or lung disease.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Calcium oxide (1305-78-8)	
LC50 Fish [1]	1070 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [static])

12.2. Persistence and Degradability

No additional information available.

12.3. Bioaccumulative Potential

Calcium oxide (1305-78-8)	
BCF fish [1]	(no bioaccumulation)

12.4. Mobility in Soil

No additional information available.

12.5. Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, and international regulations.

SECTION 14: TRANSPORT INFORMATION

14.1 In Accordance with DOT Not regulated for transport

14.2 In Accordance with IMDG Not regulated for transport

14.3 In Accordance with IATA Not regulated for transport

SECTION 15: REGULATORY INFORMATION

15.1 US Federal Regulations

Class F Fly Ash	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Delayed (chronic) health hazard

Quartz (14808-60-7)
Listed on the United States TSCA (Toxic Substances Control Act) Inventory

Calcium oxide (1305-78-8)
Listed on the United States TSCA (Toxic Substances Control Act) Inventory

15.2 US State Regulations

Quartz (14808-60-7)	
U.S. - California - Proposition 65 - Carcinogens List	WARNING: This product contains chemicals known to the State of California to cause cancer.

Quartz (14808-60-7)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - Pennsylvania - RTK (Right to Know) List

Calcium oxide (1305-78-8)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision date: 06/05/2014

Other Information: This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

GHS Full Text Phrases:

Aquatic Acute 3	Hazardous to the aquatic environment - Acute Hazard Category 3
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3
Carc. 1A	Carcinogenicity Category 1A
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Eye Irrit. 2A	Serious eye damage/eye irritation Category 2A

Skin Corr. 1C	Skin corrosion/irritation Category 1C
Skin Irrit. 2	Skin corrosion/irritation Category 2
STOT RE 1	Specific target organ toxicity (repeated exposure) Category 1
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H318	Causes serious eye damage
H319	Causes serious eye irritation
H335	May cause respiratory irritation
H350	May cause cancer
H372	Causes damage to organs through prolonged or repeated exposure
H402	Harmful to aquatic life
H412	Harmful to aquatic life with long lasting effects

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

SDS US (GHS HazCom)